SEQUENCE LISTING

```
<110> COHEN-HAGUENAUER, Odile
<120> RETROVIRAL VECTOR FOR THE TRANSFER AND EXPRESSION OF
     GENES FOR THERAPEUTIC PURPOSES IN EUKARYOTIC CELLS
<130> 8076.110USC1
<140> US 09/433,322
<141> 1999-11-03
<150> US 08/270,662
<151> 1994-06-30
<150> FR 9308015
<151> 1993-06-30
<160> 16
<170> PatentIn Ver. 2.1
<210> 1
<211> 2999
<212> DNA
<213> Viral DNA used for FOCH29
agtgaattcc gattagttca atttgttaaa gacaggatct cagtagtcca ggctttagtc 60
ctgactcaac aataccacca gctaaaacca ctagaatacg agccacaata aataaaagat 120
tttatttagt ttccagaaaa aggggggaat gaaagacccc accaaattgc ttagcctgat 180
agccgcagta acgccatttt gcaaggcatg gaaaaatacc aaaccaagaa tagagaagtt 240
cagatcaagg gcgggtacac gaaaacagct aacgttgggc caaacaggat atctgcggtg 300
agcagttteg geceeggee ggggeeaaga acagatggte acegeggtte ggeeeggee 360
cggggccaag aacagatggt ccccagatat ggcccaaccc tcagcagttt cttaagaccc 420
atcagatgtt tccaggctcc cccaaggacc tgaaatgacc ctgtgcctta tttgaattaa 480
ccaatcagcc tgcttctcgc ttctgttcgc gcgcttctgc ttcccgagct ctataaaaga 540
gctcacaacc cctcactcgg cgccagtcct ccgatagact gagtcgcccg ggtacccgtg 600
tatccaataa atcctcttgc tgttgcatcc gactcgtggt ctcgctgttc cttgggaggg 660
tetecteaga gtgattgaet accepteteg ggggtettte atttggggge tegteeggga 720
totggagaco cotgeocagg gaccacegae coaccacegg gaggtaaget ggccageaat 780
tgttctgtgt ctgtccattg tcctgtgtct ttgattgatt ttatgcgcct gtgtctgtac 840
tagttggccg actagattgg tatctggcgg atccgtggtg gaactgacga gttcgagaca 900
cccggccgca accctgggag acgtcccagg gacttcgggg gccatttttg tggcccggcc 960
agagtccaac catcccgatc gttttggact ctttggtgca cccccttag aggaggggta 1020
tgtggttctg gtaggagaca gagggctaaa acggtttccg cccccgtctg agtttttgct 1080
tteggtttgg aaccgaagee gegeegegeg tettgtetge tgeageateg ttetgtgttg 1140
tetetgtttg actgttttc tgtatttgtc tgaaaacatg ggccaggctg ttaccacccc 1200
cttaagtttg actttagacc actggaagga tgtcgaacgg acagcccaca acctgtcggt 1260
agaggttaga aaaaggcgct gggttacatt ctgctctgca gaatggccaa ccttcaacgt 1320
cggatggcca cgagacggca cttttaaccc agacattatt acacaggtta agatcaaggt*1380
 cttctcacct ggcccacatg gacatccgga tcaggtcccc tacatcgtga cctgggaagc 1440
tatagcagta gaccccctc cctgggtcag acccttcgtg caccctaaac ctcccctctc 1500
 tettecceet teageceect eteteccaee tgaaceceea etetegaeee egeeceagte 1560
 ctccctctat ccggctctca cttctccttt aaacaccaaa cctaggcctc aagtccttcc 1620
```

agggccaccc tctcctgacg ggaacggcga tagcggagaa gtggccccta cagaaggagc 1740 ccctgaccct tccccaatgg tatcccgcct gcggggaaga aaagaacccc ccgtggcgga 1800 ttctactacc tctcaggcgt tcccccttcg cctgggaggg aatggacagt atcaatactg 1860 gccattttcc tcctctgacc tctataactg gaaaaataac aacccctctt tctccgagga 1920 cccagctaaa ttgacagctt tgatcgagtc cgttctcctt actcatcagc ccacttggga 1980 tgactgccaa cagctattag ggaccctgct gacgggagaa gaaaaacagc gagtgctcct 2040 agaggcccga aaggcggttc gaggggagga cggacgccca actcaggggg atcctctaga 2100 gtcgacctgc aggcatgcaa gctcagatcc aattcgatta gttcaatttg ttaaagacag 2160 gatctcagta gtccaggctt tagtcctgac tcaacaatac caccagctaa aaccactaga 2220 atacgagcca caataaataa aagattttat ttagtttcca gaaaaagggg ggaatgaaag 2280 accccaccaa attgcttagc ctgatagccg cagtaacgcc attttgcaag gcatggaaaa 2340 ataccaaacc aagaatagag aagttcagat caagggcggg tacacgaaaa cagctaacgt 2400 tgggccaaac aggatatctg cggtgagcag tttcggcccc ggcccggggc caagaacaga 2460 tggtcaccgc ggttcggccc cggcccgggg ccaagaacag atggtcccca gatatggccc 2520 aaccctcagc agtttcttaa gacccatcag atgtttccag gctcccccaa ggacctgaaa 2580 tgaccetgtg cettatttga attaaccaat cagcetgett etegettetg ttegegeget 2640 tetgettece gagetetata aaagagetea caaceetea eteggegeea gteeteegat 2700 agactgagtc gcccgggtac ccgtgtatcc aataaatcct cttgctgttg catccgactc 2760 gtggtctcgc tgttccttgg gagggtctcc tcagagtgat tgactacccg tctcgggggt 2820 ctttcatttg ggggctcgtc cgggatctgg agacccctgc ccagggacca ccgacccacc 2880 accgggaggt aagctggcca gcaattgttc tgtgtctgtc cattgtcctg tgtctttgat 2940 tgattttatg cgcctgtgtc tgtactagtt ggccgactag attggtatct ggcggatct 2999

```
<210> 2
<211> 8323
<212> DNA
<213> Friend murine leukemia virus (F-MuLV)
```

gcgccagtcc tccgatagac tgagtcgccc gggtacccgt gtatccaata aatcctcttg 60 ctgttgcatc cgactcgtgg tctcgctgtt ccttgggagg gtctcctcag agtgattgac 120 tacccgtctc gggggtcttt catttggggg ctcgtccggg atctggagac ccctgcccag 180 ggaccaccga cccaccaccg ggaggtaagc tggccagcaa ttgttctgtg tctgtccatt 240 gtcctgtgtc tttgattgat tttatgcgcc tgtgtctgta ctagttggcc gactagattg 300 gtatctggcg gatccgtggt ggaactgacg agttcgagac acccggccgc aaccctggga 360 gacgtcccag ggacttcggg ggccattttt gtggcccggc cagagtccaa ccatcccgat 420 cgttttggac tctttggtgc accccctta gaggagggt atgtggttct ggtaggagac 480 agagggctaa aacggtttcc gccccgtct gagtttttgc tttcggtttg gaaccgaagc 540 cgcgccgcgc gtcttgtctg ctgcagcatc gttctgtgtt gtctctgttt gactgttttt 600 ctgtatttgt ctgaaaacat gggccaggct gttaccaccc ccttaagttt gactttagac 660 cactggaagg atgtcgaacg gacagcccac aacctgtcgg tagaggttag aaaaaggcgc 720 tgggttacat tctgctctgc agaatggcca accttcaacg tcggatggcc acgagacggc 780 acttttaacc cagacattat tacacaggtt aagatcaagg tcttctcacc tggcccacat 840 ggacatccgg atcaggtccc ctacatcgtg acctgggaag ctatagcagt agacccccct 900 ccctgggtca gacccttcgt gcaccctaaa cctcccctct ctcttccccc ttcagccccc 960 teteteceae etgaaceece actetegace eegececagt ceteceteta teeggetete 1020 acttctcctt taaacaccaa acctaggcct caagtccttc ctgatagcgg aggaccactc 1080 attgatctac tcacggagga ccctccgcct taccgggacc cagggccacc ctctcctgac 1140 gggaacggcg atagcggaga agtggcccct acagaaggag cccctgaccc ttccccaatg 1200 gtatcccgcc tgcggggaag aaaagaaccc cccgtggcgg attctactac ctctcaggcg 1260 ttccccttc gcctgggagg gaatggacag tatcaatact ggccattttc ctcctctgac 1320 ctctataact ggaaaaataa caacccctct ttctccgagg acccagctaa attgacagct 1380 ttgatcgagt ccgttctcct tactcatcag cccacttggg atgactgcca acagctatta 1440 gggaccctgc tgacgggaga agaaaaacag cgagtgctcc tagaggcccg aaaggcggtt 1500 cgaggggagg acggacgccc aactcagctg cccaatgaca ttaatgatgc ttttcccttg 1560 gaacgtcccg actgggacta caacacccaa cgaggtagga accacctagt ccactatcgc 1620 cagttgctcc tagcgggtct ccaaaacgcg ggcagaagcc ccaccaattt ggccaaggta 1680 aaagggataa cccagggacc taatgagtct ccctcagcct ttttagagag actcaaggag 1740 gectategea gatacaetee ttatgaeeet gaggaeeeag ggeaagaaae caatgtggee 1800 atgtcattca tctggcagtc cgccccggat atcgggcgaa agttagagcg gttagaagat 1860 ttgaagagta agaccttagg agacttagtg agggaagctg aaaagatctt taataaacga 1920 gaaaccccgg aagaaagaga ggaacgtatt aggagagaaa cagaggaaaa ggaagaacgc 1980 cgtagggcag aggatgtgca gagagagaag gagagggacc gcagaagaca tagagaaatg 2040 agtaagttgc tggctactgt cgttagcggg cagagacagg atagacaggg aggagagcga 2100 aggaggcccc aactcgacca cgaccagtgt gcctactgca aagaaaaggg acattgggct 2160 agagattgcc ccaagaagcc aagaggaccc cggggaccac gaccccaggc ctccctcctg 2220 accttagacg attagggagg tcagggtcag gagccccccc ctgaacccag gataaccctc 2280 agagtcgggg ggcaacccgt caccttccta gtggatactg gggcccaaca ctccgtgctg 2340 acccaaaatc ctggacccct aagtgacaag tctgcctggg tccaaggggc tactggaggg 2400 aagcggtatc gctggaccac ggatcgccga gtgcacctag ccaccggtaa ggtcacccat 2460 tettteetee atgtaccaga ttgeecetat cetetgetag gaagagattt getgaetaaa 2520 ctaaaagccc aaattcactt tgagggatca ggagctcagg ttgtgggacc aatgggacag 2580 cccctgcaag tgctgaccct aaacatagaa gatgagtatc ggctacatga gacctcaaaa 2640 gggccagatg tgcctctagg gtccacatgg ctctctgatt ttccccaggc ctgggcagaa 2700 accgggggca tggggctggc cgttcgccaa gctcctctga tcatacctct gaaggcaacc 2760 tctacccccg tgtccataaa acaatacccc atgtcacaag aagccagact ggggatcaag 2820 ccccacatac agagactgct ggatcaggga attctggtac cctgccagtc cccctggaac 2880 acgcccctgc tacccgttaa gaaaccgggg actaatgatt ataggcctgt ccaggatctg 2940 agagaagtca acaagcgggt ggaagacatc caccccaccg tgcccaaccc ttacaacctc 3000 ttgagcgggc tcccaccgtc ccaccagtgg tacactgtgc ttgacttaaa agatgctttt 3060 ttctgcctga gactccaccc caccagtcag tctctcttcg cctttgagtg gagagatcca 3120 gagatgggaa totcaggaca attaacotgg accagactoc cgcagggttt caaaaacagt 3180 cccaccctgt ttgatgaagc cctgcacagg gacctcgcag acttccggat ccagcaccca 3240 gacctgattc tgctccagta tgtagatgac ttactgctgg ccgccacttc tgagcttgac 3300 tgtcaacaag gtacgcgggc cctgttacaa accctagggg acctcggata tcgggcctcg 3360 gccaagaaag cccaaatttg ccagaaacag gtcaagtatc tggggtatct tctaaaagag 3420 ggtcagagat ggctgactga ggccagaaaa gagactgtga tggggcagcc tactccgaag 3480 acccetegae aactaaggga gtteetaggg aeggeagget tetgtegeet etggateeet 3540 gggtttgcag aaatggcagc cccttgtac cctctcacca aaacggggac tctgtttgag 3600 tggggcccag accagcaaaa ggcctaccaa gagatcaagc aggctctctt aactgcccct 3660 gccctgggat tgccagactt gactaagccc ttcgaacttt ttgttgacga gaagcagggc 3720 tacgccaaag gtgtcctaac gcaaaaactg gggccttggc gtcggccggt ggcctacctg 3780 tccaaaaagc tagacccagt ggcagctggg tggccccctt gcctacggat ggtagcagcc 3840 atcgccgttc tgaccaaaga cgctggcaag ctcaccatgg gacagccact agtcattctg 3900 gcccccatg cagtagaggc actagttaag caaccccctg atcgctggct ctccaacgcc 3960 cgaatgaccc actaccaggc tetgettetg gacacggacc gagtecagtt eggaccaata 4020 gtggccctaa acccagctac gctgctccct ctacctgagg aggggctgca acatgactgc 4080 cttgacatct tggctgaagc ccacggaact agaccagatc ttacggacca gcctctccca 4140 gacgctgacc acacctggta cacagatggg agcagcttcc tgcaagaggg gcagcgcaag 4200 gccggagcag cagtaaccac cgagaccgag gtagtctggg ccaaagcact gccagccggg 4260 acateggeee aaagagetga gttgatageg etcacecaag eettaaaaat ggeagaaggt 4320 aagaagctga atgtttacac cgatagccgt tatgcttttg ccactgccca tattcacgga 4380 gaaatatata gaaggcgcgg gttgctcaca tcagaaggaa aagaaatcaa aaataaggac 4440 gagatettgg ecetactgaa ggetetette etgeecaaaa gaettageat aatteattge 4500 ccgggacatc agaagggaaa ccgcgcggag gcaaggggca acaggatggc cgaccaagcg 4560 gcccgagaag tagccactag agaaactcca gagacttcca cacttctgat agaaaattca 4620 gccccctata ctcatgaaca ttttcactat acggtgactg acataaaaga tctgactaaa 4680 ctaggggcca cttatgacga tgcaaagaag tgttgggttt atcagggaaa gcctgtaatg 4740 cctgatcaat tcacctttga actattagat tttcttcatc aattgaccca cctcagtttc 4800 tcaaaaacaa aggctcttct agaaaggaac tactgtcctt attacatgct gaaccgggat 4860 cgaacgctca aagacatcac tgagacttgc caagcctgtg cacaggtcaa tgccagcaag 4920 totgoogtoa aacaagggao tagagttoga gggcaccgao coggoaccoa ctgggaaatt 4980 gatttcactg aggtaaaacc tggcctgtat gggtataaat atcttttagt tttcatagac 5040 actttctctg gatgggtaga agctttccca accaagaaag aaactgccaa agttgtaacc 5100 aagaagctac tagaagaaat cttccccaga ttcggcatgc cacaggtatt gggaaccgac 5160 aatgggcctg ccttcgtctc caaggtaagt cagacagtag ccgatttact gggggttgat 5220 tggaaactac attgtgctta cagaccccag agttcaggtc aggtagaaag aatgaatagg 5280 acaatcaagg agactttaac taaattgacg cttgcaactg gctctaggga ctgggtgctc 5340 ctgcttcccc tagccctgta tcgagcccgc aacacgccgg gcccccatgg tctcacccca 5400 tatgaaatet tatatgggge acceeegeee ettgtaaaet teeetgatee tgacatggea 5460 aaggttactc ataacccctc tctccaagcc catttacagg cactctacct ggtccagcac 5520 gaagtetgga gacegttgge ggeagettae caagaacaae tggaeeggee ggtagtgeet 5580 caccetttee gagteggtga cacagtgtgg gteegeagae accaaactaa aaatetagaa 5640 ccccgctgga aaggacctta taccgtccta ctgactaccc ccaccgctct caaagtggac 5700 ggcattgcag cgtggatcca cgctgcccac gtaaaggctg ccgacaccag gattgagcca 5760 ccatcggaat cgacatggcg tgttcaacgc tctcaaaatc ccctaaagat aagattgacc 5820 cgcgggacct cctaatcccc ttaattctct tcctgtctct caaaggggcc agatccgcag 5880 cacceggete cageetteae caggtetaea acattacetg ggaagtgaee aatggggate 5940 gggagacagt atgggcaata tcaggcaacc accetetgtg gacttggtgg ccagteetca 6000 ccccagattt gtgtatgtta gctctcagtg ggccgcccca ctgggggcta gagtatcagg 6060 ccccctattc ctcgcccccg gggccccctt gttgctcagg gagcagcggg aacgttgcag 6120 gctgtgccag agactgcaac gagcccttga cctccctcac ccctcggtgc aacactgcct 6180 ggaacagact taagctggac caggtaactc ataaatcaag tgagggattt tatgtctgcc 6240 cegggtcaca tegeceeegg gaagecaagt cetgtggggg tecagaetee ttetaetgtg 6300 cctcttgggg ctgcgagaca accggtagag tatactggaa gccctcctct tcttgggact 6360 acatcacagt agacaacaat ctcacctcta accaggctgt tcaggtatgc aaagacaata 6420 agtggtgcaa tecettgget ateeggttta caaacgeegg gaaacaggte aceteatgga 6480 caactggaca ctattggggt ctacgtcttt atgtctctgg acaggaccca gggcttactt 6540 tcgggatccg actcagttat caaaatctag gacctcggat cccaatagga ccaaaccccg 6600 tectggeaga ceaacttteg ttecegetae etaateeeet acceaaacet gecaagtete 6660 cccccgcctc tagttcgact cccacattga tttccccgtc ccccactccc actcagcccc 6720 cgccagcagg aacgggagac agattactaa atctagtaca gggagcttac caggcactca 6780 accttaccaa ccctgataaa actcaagagt gctggttatg cctagtgtct ggacccccct 6840 attacgaggg ggttgccgtc ctaggtactt attccaacca tacctctgcc ccagctaact 6900 gctccgtggc ctcccaacac aagctgaccc tgtccgaagt gactggacgg ggactctgca 6960 taggaacagt cccaaaaact caccaggccc tgtgcaacac tacccttaag gcaggcaaag 7020 ggtcttacta tctagttgcc cccacaggaa ctatgtgggc atgtaacact ggactcactc 7080 catgcctatc tgccaccgtg cttaatcgca ccactgacta ttgcgttctc gtggaattat 7140 ggcccagggt cacctaccat cctcccagtt acgtctatag ccagtttgaa aaatcccata 7200 gacataaaag agaaccagtg teettaacet tggeettatt attaggtggg etaactatgg 7260 gtggcatcgc cgcgggagta gggacaggaa ctaccgccct ggtcgccacc cagcagtttc 7320 agcageteca tgetgeegta caagatgate teaaagaagt egaaaagtea attaetaace 7380 tagaaaagtc tcttacttcg ttgtctgagg ttgtactgca gaatcgacga ggcctagacc 7440 tgttgttcct aaaagaggga ggactgtgtg ctgccctaaa agaagaatgt tgtttctatg 7500 ctgaccatac aggcctagta agagatagta tggccaaatt aagagagaga ctctctcaga 7560 gacaaaaact atttgagtcg agccaaggat ggttcgaagg atggtttaac agatcccct 7620 ggtttaccac gttgatatcc accatcatgg ggcctctcat tatactccta ctaattctgc 7680 tttttggacc ctgcattctt aatcgattag ttcaatttgt taaagacagg atctcagtag 7740 tccaggcttt agtcctgact caacaatacc accagctaaa accactagaa tacgagccac 7800 aataaataaa agattttatt tagtttccag aaaaaggggg gaatgaaaga ccccaccaaa 7860 ttgcttagcc tgatagccgc agtaacgcca ttttgcaagg catggaaaaa taccaaacca 7920 agaatagaga agttcagatc aagggcgggt acacgaaaac agctaacgtt gggccaaaca 7980 ggatatctgc ggtgagcagt ttcggccccg gcccggggcc aagaacagat ggtcaccgcg 8040 gttcggcccc ggcccggggc caagaacaga tggtccccag atatggccca accctcagca 8100 gtttcttaag acccatcaga tgtttccagg ctcccccaag gacctgaaat gaccctgtgc 8160 cttatttgaa ttaaccaatc agcctgcttc tcgcttctgt tcgcgcgctt ctgcttcccg 8220 agetetataa aagageteae aaceeeteae teggegegee agteeteega tagaetgagt 8280 cgcccgggta cccgtgtatc caataaatcc tcttgctgtt gca

<210> 3 <211> 22 <212> DNA

<400> 8

cagcgagacc acgagtcgga tgc

23

```
<210> 9
<211> 25
<212> DNA
<213> Oligonucleotide
<400> 9
                                                                25
aattcaatga aagaccccaa attgc
<210> 10
<211> 27
<212> DNA
<213> Oligonucleotide
<400> 10
                                                                27
taagcaattc ggtggggtct ttcattg
<210> 11
<211> 2079
<212> DNA
<213> Viral DNA used for FOCH29
tecgattagt teaatttgtt aaagacagga teteagtagt eeaggettta gteetgaete 60
aacaatacca ccagctaaaa ccactagaat acgagccaca ataaataaaa gattttattt 120
agtttccaga aaaagggggg aatgaaagac cccaccaaat tgcttagcct gatagccgca 180
agggcgggta cacgaaaaca gctaacgttg ggccaaacag gatatctgcg gtgagcagtt 300
teggeceegg eceggggeca agaacagatg gteacegegg tteggeceeg geeeggggee 360
aagaacagat ggtccccaga tatggcccaa ccctcagcag tttcttaaga cccatcagat 420
gtttccaggc tcccccaagg acctgaaatg accctgtgcc ttatttgaat taaccaatca 480
geetgettet egettetgtt egegegette tgetteeega getetataaa agageteaca 540
acccctcact cggcgccagt cctccgatag actgagtcgc ccgggtaccc gtgtatccaa 600
taaatcctct tgctgttgca tccgactcgt ggtctcgctg ttccttggga gggtctcctc 660
agagtgattg actacccgtc tcgggggtct ttcatttggg ggctcgtccg ggatctggag 720
acccetgece agggaceace gacceaceac egggaggtaa getggecage aattgttetg 780
tgtctgtcca ttgtcctgtg tctttgattg attttatgcg cctgtgtctg tactagttgg 840
ccgactagat tggtatctgg cggatccgtg gtggaactga cgagttcgag acacccggcc 900
gcaaccetgg gagacgtece agggactteg ggggccattt ttgtggcccg gccagagtec 960
aaccatcccg atcgttttgg actctttggt gcacccccct tagaggaggg gtatgtggtt 1020
ctggtaggag acagagggct aaaacggttt ccgccccgt ctgagttttt gctttcggtt 1080
tggaaccgaa gccgcgccgc gcgtcttgtc tgctgcagca tcgttctgtg ttgtctctgt 1140
ttgactgttt ttctgtattt gtctgaaaac atgggccagg ctgttaccac ccccttaagt 1200
ttgactttag accactggaa ggatgtcgaa cggacagccc acaacctgtc ggtagaggtt 1260
agaaaaaggc gctgggttac attctgctct gcagaatggc caaccttcaa cgtcggatgg 1320
ccacgagacg gcacttttaa cccagacatt attacacagg ttaagatcaa ggtcttctca 1380
cctggcccac atggacatcc ggatcaggtc ccctacatcg tgacctggga agctatagca 1440
gtagaccecc etecetgggt cagaccette gtgcacceta aacetecect etetetteec 1500
cetteagece cetetece acetgaacee ceaetetega cecegececa gteetecete*1560
tatccggctc tcacttctcc tttaaacacc aaacctaggc ctcaagtcct tcctgatagc 1620
ggaggaccac tcattgatct actcacggag gaccctccgc cttaccggga cccagggcca 1680
ccctctcctg acgggaacgg cgatagcgga gaagtggccc ctacagaagg agcccctgac 1740
cettececaa tggtateceg eetgegggga agaaaagaac eeeeegtgge ggattetaet 1800
 acctctcagg cgttccccct tcgcctggga gggaatggac agtatcaata ctggccattt 1860
```

```
tectectetg acetetataa etggaaaaat aacaaceeet ettteteega ggaeceaget 1920 aaattgacag etttgatega gteegttete ettaeteate ageecaettg ggatgaetge 1980 caacagetat tagggaecet getgaeggga gaagaaaaac agegagtget eetagaggee 2040 egaaaggegg ttegagggga ggaeggaege eeaacteag 2079
```

<210> 12 <211> 1975 <212> DNA <213> Viral DNA used for FOCH29

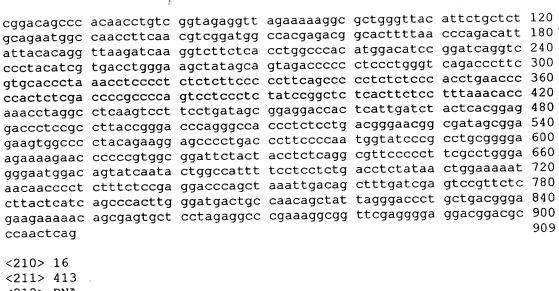
<400> 12 ataaaagatt ttatttagtt tccagaaaaa ggggggaatg aaagacccca ccaaattgct 60 tagcctgata gccgcagtaa cgccattttg caaggcatgg aaaaatacca aaccaagaat 120 agagaagtto agatcaaggg cgggtacacg aaaacagcta acgttgggcc aaacaggata 180 tetgeggtga geagtttegg ecceggeeeg gggeeaagaa eagatggtea eegeggtteg 240 geoceggeee ggggeeaaga acagatggte eccagatatg geocaaceet cageagttte 300 ttaagaccca tcagatgttt ccaggctccc ccaaggacct gaaatgaccc tgtgccttat 360 ttgaattaac caatcagect getteteget tetgttegeg egettetget teeegagete 420 tataaaagag ctcacaaccc ctcactcggc gccagtcctc cgatagactg agtcgcccgg 480 gtacccgtgt atccaataaa tcctcttgct gttgcatccg actcgtggtc tcgctgttcc 540 ttgggagggt ctcctcagag tgattgacta cccgtctcgg gggtctttca tttgggggct 600 cgtccgggat ctggagaccc ctgcccaggg accaccgacc caccaccggg aggtaagctg 660 gccagcaatt gttctgtgtc tgtccattgt cctgtgtctt tgattgattt tatgcgcctg 720 tgtctgtact agttggccga ctagattggt atctggcgga tccgtggtgg aactgacgag 780 ttcgagacac ccggccgcaa ccctgggaga cgtcccaggg acttcggggg ccatttttgt 840 ggcccggcca gagtccaacc atcccgatcg ttttggactc tttggtgcac cccccttaga 900 ggaggggtat gtggttctgg taggagacag agggctaaaa cggtttccgc ccccgtctga 960 gtttttgett teggtttgga accgaageeg egeegeget ettgtetget geageategt 1020 tetgtgttgt etetgtttga etgttttet gtatttgtet gaaaacatgg geeaggetgt 1080 taccacccc ttaagtttga ctttagacca ctggaaggat gtcgaacgga cagcccacaa 1140 cctgtcggta gaggttagaa aaaggcgctg ggttacattc tgctctgcag aatggccaac 1200 cttcaacgtc ggatggccac gagacggcac ttttaaccca gacattatta cacaggttaa 1260 gatcaaggtc ttctcacctg gcccacatgg acatccggat caggtcccct acatcgtgac 1320 ctgggaaget atageagtag acceeetce etgggteaga ecettegtge accetaaace 1380 tecetetet ettececett cagececete teteceaect gaacececae tetegacece 1440 gccccagtcc tccctctatc cggctctcac ttctccttta aacaccaaac ctaggcctca 1500 agtecttect gatageggag gaccacteat tgatetaete aeggaggaee eteegeetta 1560 ccgggaccca gggccaccct ctcctgacgg gaacggcgat agcggagaag tggcccctac 1620 agaaggagcc cctgaccctt ccccaatggt atcccgcctg cggggaagaa aagaaccccc 1680 cgtggcggat tctactacct ctcaggcgtt cccccttcgc ctgggaggga atggacagta 1740 tcaatactgg ccattttcct cctctgacct ctataactgg aaaaataaca acccctcttt 1800 ctccgaggac ccagctaaat tgacagcttt gatcgagtcc gttctcctta ctcatcagcc 1860 cacttgggat gactgccaac agctattagg gaccctgctg acgggagaag aaaaacagcg 1920

<210> 13 <211> 862 <212> DNA <213> Viral DNA used for FOCH29

<400> 13
tccgattagt tcaatttgtt aaagacagga tctcagtagt ccaggcttta gtcctgactc 60
aacaatacca ccagctaaaa ccactagaat acgagccaca ataaataaaa gattttattt 120
agtttccaga aaaagggggg aatgaaagac cccaccaaat tgcttagcct gatagccgca 180

agtgctccta gaggcccgaa aggcggttcg aggggaggac ggacgcccaa ctcag

```
agggcgggta cacgaaaaca gctaacgttg ggccaaacag gatatctgcg gtgagcagtt 300
teggeceegg eeeggggeea agaacagatg gteacegegg tteggeeeeg geeeggggee 360
aagaacagat ggtccccaga tatggcccaa ccctcagcag tttcttaaga cccatcagat 420
gtttccaggc tcccccaagg acctgaaatg acctgtgcc ttatttgaat taaccaatca 480
geetgettet egettetgtt egegegette tgetteeega getetataaa agageteaca 540
accectcact eggegeeagt ecteegatag actgagtege eegggtacee gtgtatecaa 600
taaatcctct tgctgttgca tccgactcgt ggtctcgctg ttccttggga gggtctcctc 660
agagtgattg actacccgtc tcgggggtct ttcatttggg ggctcgtccg ggatctggag 720
acceptace agggaceace gacecaceae egggaggtaa getggeeage aattgttetg 780
tgtctgtcca ttgtcctgtg tctttgattg attttatgcg cctgtgtctg tactagttgg 840
                                                                 862
ccqactagat tggtatctgg cg
<210> 14
<211> 1617
<212> DNA
<213> Friend murine leukemia virus (F-MuLV)
<400> 14
atgggccagg ctgttaccac ccccttaagt ttgactttag accactggaa ggatgtcgaa 60
cggacagccc acaacctgtc ggtagaggtt agaaaaaggc gctgggttac attctgctct 120
gcagaatggc caacettcaa cgtcggatgg ccacgagacg gcacttttaa cccagacatt 180
attacacagg ttaagatcaa ggtcttctca cctggcccac atggacatcc ggatcaggtc 240
ccctacatcg tgacctggga agctatagca gtagaccccc ctccctgggt cagacccttc 300
gtgcacceta aaceteceet etetetteee eetteageee eeteteteee aeetgaacee 360
ccactetega eccegececa gteetecete tateeggete teaettetee tttaaacace 420
aaacctaggc ctcaagtcct tcctgatagc ggaggaccac tcattgatct actcacggag 480
gacceteege ettaceggga eccagggeca eceteteetg aegggaaegg egatagegga 540
gaagtggccc ctacagaagg agcccctgac ccttccccaa tggtatcccg cctgcgggga 600
agaaaagaac cccccgtggc ggattctact acctctcagg cgttccccct tcgcctggga 660
gggaatggac agtatcaata ctggccattt tcctcctctg acctctataa ctggaaaaat 720
aacaacccct ctttctccga ggacccagct aaattgacag ctttgatcga gtccgttctc 780
cttactcatc agcccacttg ggatgactgc caacagctat tagggaccct gctgacggga 840
gaagaaaaac agcgagtgct cctagaggcc cgaaaggcgg ttcgagggga ggacggacgc 900
ccaactcagc tgcccaatga cattaatgat gcttttccct tggaacgtcc cgactgggac 960
tacaacaccc aacgaggtag gaaccaccta gtccactatc gccagttgct cctagcgggt 1020
ctccaaaacg cgggcagaag ccccaccaat ttggccaagg taaaagggat aacccaggga 1080
cctaatgagt ctccctcagc ctttttagag agactcaagg aggcctatcg cagatacact 1140
cettatgace etgaggacee agggeaagaa accaatgtgg ceatgteatt catetggeag 1200
teegeeegg atategggeg aaagttagag eggttagaag atttgaagag taagacetta 1260
ggagacttag tgagggaagc tgaaaagatc tttaataaac gagaaacccc ggaagaaaga 1320
gaggaacgta ttaggagaga aacagaggaa aaggaagaac gccgtagggc agaggatgtg 1380
cagagagaga aggagagga ccgcagaaga catagagaaa tgagtaagtt gctggctact 1440
gtcgttagcg ggcagagaca ggatagacag ggaggagagc gaaggaggcc ccaactcgac 1500
cacgaccagt gtgcctactg caaagaaaag ggacattggg ctagagattg ccccaagaag 1560
ccaagaggac cccggggacc acgaccccag gcctccctcc tgaccttaga cgattag
 <210> 15
 <211> 909
 <212> DNA
 <213> Friend murine leukemia virus (F-MuLV)
 <400> 15
 atgggccagg ctgttaccac ccccttaagt ttgactttag accactggaa ggatgtcgaa 60
```



<212> DNA <213> Friend murine leukemia virus (F-MuLV)

<400> 16 atgggccagg ctgttaccac ccccttaagt ttgactttag accactggaa ggatgtcgaa 60 cggacagccc acaacctgtc ggtagaggtt agaaaaaggc gctgggttac attctgctct 120 gcagaatggc caacettcaa cgtcggatgg ccacgagacg gcacttttaa cccagacatt 180 attacacagg ttaagatcaa ggtcttctca cctggcccac atggacatcc ggatcaggtc 240 cectacateg tgacetggga agetatagea gtagacecee etecetgggt cagaceette 300 gtgcacccta aacctcccct ctctcttccc ccttcagccc cctctctccc acctgaaccc 360 ccactetega eccegececa gteetecete tateeggete teaettetee ttt 413